Bio&NanoTech2024
INTERNATIONAL BIOTECHNOLOGY AND NANOTECHNOLOGY CONGRESS
October 30- November 01, 2024 / Ardahan University, Ardahan, Türkiye

Bio-insecticide effect, Antibacterial activity of *Rosmarinus officinalis* and *Origanum vulgare* essential oils from Algeria

AMROUCHE Zoheir[1, 2,3*], El HADI Djamel[2] , FAUCONNIER Marie-Laure[3] , Laribi-Habchi Hassiba[2].

1- Biological Department, Faculty of the nature and life Sciences, University of Khemis Miliana- Algeria
2- Functionnal analysis of chemical process laboratory. chemistry department, University of Blida 1-Algeria
3-General and organic chemistry laboratory Agro-biotech Gembloux, University of Liege-Belgium.

*Corresponding author: zoheir.amrouche@yahoo.fr

Abstract

The essential oils of *Rosmarinus officinalis* and *Origanum vulgare* from the Ain Bouyahia and Amra regions, focusing on extraction yields, antioxidant, and anti-inflammatory, antibacterial, and bio-insecticide activities. The essential oil from Ain Bouyahia region showed the best extraction yield at 1.88% for *Origanum vulgare,* while the essential oil from *Rosmarinus officinalis* showed a yield of 0.13%. Using the DPPH method, neither essential oil showed significant antioxidant activity. However, the IC50 values were 36, 57µg/ml for *O. vulgare* (Amra region) and 33, 68 µg/ml for *R. officinalis*, approaching the IC50 of ascorbic acid (30, 68µg/ml). In the denaturation of ovalbumin assay *O. vulgare* from Amra demonstrated slightly better efficacy (74.29% inhibition at 400µg/ml) compared to Ain Bouyahia (73, 06%). *R. officinalis* from Amra also showed higher inhibition rates 74.64% at 400µg/ml compared to Ain Bouyahia 73, 23%.

The antibiogram method revealed notable antibacterial efficacy against *Aspergillus niger* and *Candida albicans,* particularly in the Amra region .Notable inhibition zones included 67 ± 0.3 mm and 65 ± 0.38 mm against *C. albicans* for oregano and rosemary oils from Amra, respectively. The oils also showed activity against Gram-positive bacteria such as Bacillus cereus 30 ± 0.4 mm and *Staphylococcus aureus* 62 ± 0.35 mm, and varied efficacy against Gram-negative bacteria, with inhibition zones up to 65 ± 0.38 mm against *Pseudomonas aeruginosa* and 43 ± 0.40 mm against *Salmonella typhi* .

The result of bio-insecticide activity, *Origanum vulgare* oil from Ain Bouyahia and *Rosmarinus officinalis* oil from Amra were selected. All doses of essential oils showed efficacy against the insect *T. Castaneum* especially rosemary.

The essential oils from both regions demonstrated significant biological activities, with variations in efficacy depending on the region and the type of oil. These findings highlight the potential of rosemary and oregano essential oils as natural antioxidants, anti-inflammatory agents, antibacterials, and bio-insecticides.

Keywords: Bio-insecticides, *Origanum vulgare, Rosmarinus officinalis,* Antibacterial activity.